

PATENT COOPERATION TREATY

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REC'D 10 MAR 2005

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 62740A	FOR FURTHER ACTION See Form PCT/PEA416	
International application No. PCT/US2004/011534	International filing date (day/month/year) 15.04.2004	Priority date (day/month/year) 17.04.2003
International Patent Classification (IPC) or national classification and IPC H01L21/762, H01L21/312		
Applicant DOW GLOBAL TECHNOLOGIES INC. et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 15.02.2005	Date of completion of this report 09.03.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Kenevey, K Telephone No. +49 89 2399-7171	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/011534

Box No. 1 Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-11 as originally filed

Claims, Numbers

1-25 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-10, 12-18, 20-23
	No: Claims	1, 11, 19, 24, 25
Inventive step (IS)	Yes: Claims	
	No: Claims	2-10, 12-18, 20-23
Industrial applicability (IA)	Yes: Claims	1-25
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V.

The following document is referred to in this communication:

D1: US 2002/110665 A1 (RUTTER EDWARD W ET AL) 15 August 2002 (2002-08-15)

- 1 The application does not meet the requirements of Article 6 PCT, because claim 1 is not clear for the following reasons:
 - (i) the term "less than *about* 0.3 microns" is not defined. This could mean less than 0.5 microns or less than 0.28 microns, for example.
 - (ii) the term "thermally deactivatable gap-filling aid" is vague and undefined, since it is neither clear how gap-filling is to be aided (for example, by a viscosity change or by material adhesion enhancement) nor what is intended by thermal deactivation (the material could, for example, undergo stereochemical transformation, be decomposed etc).
 - (iii) the term "substantially filling the recessed feature" does not define to what extent the feature is filled. The feature could be completely buried by the filling composition or 51% filled or be conformally filled with a thin layer or filling material, for example.
 - (iv) concerning the term "curable polymeric material" it is noted that any material is "curable" *per se*.
- 2 In any case, the above-mentioned lack of clarity notwithstanding, the subject matter of claims 1, 11, 19, 24, 25 is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

2.1 D1 discloses (paragraphs [0056], [0076]-[0078]):

A method comprising:

- (a) providing a substrate having at least one recessed feature characterized by a width of less than about 0.3 microns and an aspect ratio of 5 or higher,
- (b) coating onto the substrate a composition comprising (i) a curable polymeric material, (ii) a thermally deactivatable gap-filling aid (see item 2.2 below), and (iii) at least one solvent,
- (c) drying the coated substrate to remove the solvent, leaving a composition of

curable polymeric material and gap-filling aid substantially filling the recessed feature,
(d) heating the coated substrate to cure the polymeric material and to de-activate the gap-filling aid.

Therefore the subject matter of claim 1 is not new.

- 2.2 It is pointed out that dimethyl adipate is a plasticizer (paragraph [0056]) and thus is considered to be an additive which aids gap-filling.
- 2.3 Concerning claim 11, D1 further discloses (paragraph [0076]) that the polymer is organic.
- 2.4 Concerning claim 19, D1 further discloses that the gap-filling aid is a reactive monomer.
- 2.5 Concerning claims 24, 25: since the method of using the composition to coat an article is disclosed, neither an article produced by the method nor the composition are new.
- 3 The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claims 2-10, 12-18, 20-23 does not involve an inventive step in the sense of Article 33(3) PCT.
 - 3.1 Concerning claims 2-5: the glass transition and thermal stability temperatures of any cured polymeric material are merely resulting properties and do not involve any inventive step.
 - 3.2 Concerning claim 6, 7: the choice of a higher aspect ratio or a reduced feature dimension involves no inventive step. The person skilled in the art continually adapts to meet the demands of technological trends towards lower feature sizes and increased aspect ratios.
 - 3.3 Concerning claims 8-10: whether the gap-filling aid material reacts with the polymeric material, volatilizes or decomposes depends entirely on the nature of the materials and no inventive activity is acknowledged.

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- 3.4 The subject matter of the claims 12-18, 20-23 refers to choice of materials and optimisation of compositional proportions which would be determined by experimental trial and error and no inventive step can be recognised.